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TEXTURE

ORLANDO'S TECHNOLOGY LANDSCAPE

SCIENCE, NOT FICTION

Central Florida biomed cluster takes hold

A MAJOR PLAYER

Orlando's fast becoming video-gaming industry hub

ONE COOL DUDE

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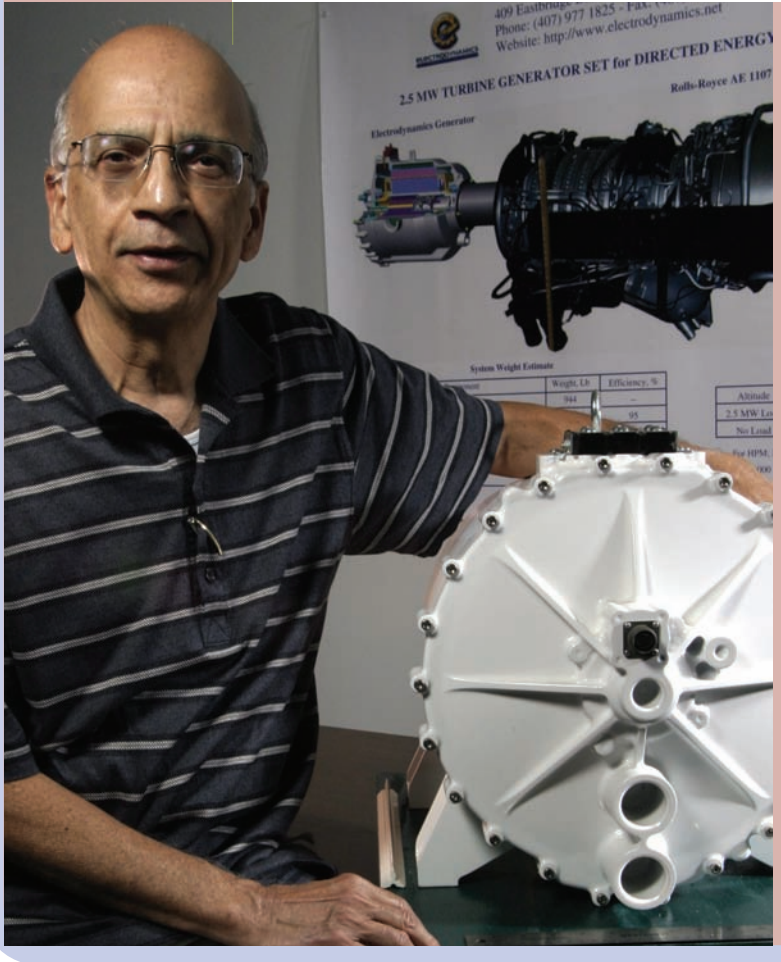
Generating BUSINESS

ELECTRODYNAMICS ASSOCIATES SEES ENORMOUS POTENTIAL IN SMALL GENERATOR.

By Nancy Curry

Advances in technology tend to make things smaller ... consider how one of today's laptops can perform tasks that formerly required a roomful of mainframe computers. But what about the electrical power that drives so much technology, and almost every aspect of daily life?



Orlando-based Electrodynamics Associates, Inc. is on the cusp of introducing a vastly smaller and more efficient electric generator with the potential to revolutionize the military, aerospace and commercial sectors. Established in 1995, the company develops compact, high-density electric power generators and alternative energy solutions.

The firm has produced a prototype 2.5-megawatt generator roughly the size of a rolled-up sleeping bag.

"It weighs approximately 350 lbs," says Electrodynamics Associates Founder and President Jay Vaidya, "as opposed to comparable commercial machines that weigh 15 times as much and are considerably larger. Nobody else has this kind of generator."

For perspective, a 2.5-megawatt generator can power 2,000 homes continuously.

"After a hurricane, you could take it in to provide power to an entire subdivision," says Vaidya. "It's transportable because it's so lightweight. This is a product that's ready for final testing and

getting a lot of interest for both military and commercial applications."

The generator is timely, says Vaidya, because it will support the aircraft industry's move toward more efficient and compact generators in airborne propulsion systems.

"Current generation aircraft utilize bleed air from the engine to de-ice the wings," he says. "And the engine also directly drives the compressors for environmental control systems. The 'more electric engine' on next generation planes will delegate these functions to the electric generator, substantially improving fuel efficiency and reducing the overall weight and cost of building the airplane.

"With this development, the generator coupled to the propulsion engine needs to be more powerful than current technology generators. We can support that requirement."

There are myriad applications for the transportable generator, but the biggest challenge for the entrepreneur is transitioning into production.

"It will probably be eighteen months before we make that move, but we are getting certain inquiries for quantities of our products."

One prospective buyer wanted to purchase 4,000 generators over the next five years ... potentially a $40 million contract ... but ultimately passed on Electrodynamics' proposal because the cost of producing prototypes was too high.

"We were looking at $300,000 for three units and controllers," says Vaidya, "but with large-scale production, we could produce them for as little as $10,000 a piece. At this point, only a much larger company can underwrite this kind of production. We need a partner to amortize the cost of prototypes and large-scale production.

"Airplane manufacturers ask us for proposals to develop generators for the new generation planes. The reason they come to us is the handful of large companies that can produce on this scale tend to be highly invested in their technologies, so in response to a problem, the solution they provide is based on their production abilities. That's how we differ. As a small company, we try to look at a problem and apply the best solution to it ... independent of existing production constraints."

The company is also exploring applications for biomass-fueled generators.

"Probably the most effective application is using the waste from agricultural products, such as sugar cane," says Vaidya. "The processing waste left behind after you extract the juice can be converted to fuel and put into a high-speed turbine engine to drive the generator to produce electricity. If you had one of these generators in a sugar cane factory, you could use the power to actually run the factory, and even send some power back to the grid."

"[THE 2.5 MEGAWATT GENERATOR] WEIGHS APPROXIMATELY 350 LBS AS OPPOSED TO COMPARABLE COMMERCIAL MACHINES THAT WEIGH 15 TIMES AS MUCH AND ARE CONSIDERABLY LARGER. NOBODY ELSE HAS THIS KIND OF GENERATOR." — *JAY VAIDYA*

AN ELECTRIFYING START

Vaidya developed its 2.5-megawatt generator in response to a broad solicitation by the U.S. Air Force, but his company has been propelled by several different research grants. One such boost came from the Florida High Tech Corridor Council (FHTCC)'s innovative Matching Grants Research Program, which partners high tech companies with research universities.

In 2000, FHTCC provided Electrodynamics Associates with $54,000 as part of a study for the National Aeronautics and Space Administration (NASA)'s Small Business Technology Transfer Research (STTR) program to design power supply for its ground-based computers. The firm successfully delivered the high-efficiency sample power supplies to NASA and has since applied for and won two additional FHTCC matching grants worth $90,000. These correspond to eight Small Business Innovation Research (SBIR) phase I contracts, and five Phase II contracts for research in the field of high power density electric generators.

"The 2.5-megawatt generator has benefited from a lot of analysis on the thermal side from the University of Central Florida (UCF) and its student researchers," says Vaidya. "This product has had perhaps the most impact from the initial FHTCC funding. UCF helped us design the generator in a very compact size that makes it suitable for airborne applications."

Most of the company's growth has taken place in research and development, increasing from two to seven employees. The firm also works with 10 outside consultants from around the country.

UCF and the engineering talent in Florida's High Tech Corridor were key to Vaidya's decision to found his company in Orlando. Despite building a successful career in Illinois at Sundstrand Aerospace, including a stint as chief research engineer, he returned to Central Florida when it was time to build his own company. He had earned his Master's degree in Electrical Engineering from UCF in 1974, when it was known as Florida Technological University.

Vaidya estimates there are no more than six to eight companies doing similar work nationwide. And, he and his firm are making waves in the industry: in 2005, the Orlando chapter of the Institute of Electrical and Electronics Engineers (IEEE) honored Vaidya as its entrepreneur of the year.

"Mr. Vaidya is really a brilliant man," says Tom Wu, PhD, associate professor in UCF's department of electrical and computer engineering and chairman of the IEEE's 2005 awards committee. "He's done outstanding work with high-speed generators, and it's work that's very important for the future of this country."